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AN ANALYTIC APPRAISAL OF SELECTED HIGH SCHOOL  
VOCATIONAL MATHEMATICS TEXTBOOKS

by

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B. S., Western Michigan University, 1959

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A MASTER'S REPORT

submitted in partial fulfillment of the

requirements for the degree

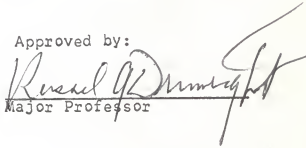
MASTER OF SCIENCE

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## THE PROBLEM

### Introduction

Statistics have shown that the labor force in our country has been increasing at a very rapid rate during the last few years. Many authorities have indicated an expectation of a continued increase in the future. They have also indicated a concern for the proper education of this new segment of the labor force. Abraham Ribicoff expressed this tenet through the following statement:

We now have 74 million people in our labor force. By 1970, the number will have swelled to 87 million--an increase of 20 per cent and the greatest in any 10-year period in our national history.

If we train and use this rapidly growing labor force properly, the United States will be accordingly stronger and more prosperous. If we don't we're in for trouble.<sup>1</sup>

Logically, the next step was to determine what constituted the proper training. In view of the jobs to be filled, it was readily seen that vocational education would be of utmost importance. This belief was clearly expressed by Ribicoff when he said:

Unfilled jobs are magnets--but not just for hands. They are magnets for trained hands and trained minds--for skills. And it is to vocational education that we will need to turn, more and more, to develop the skills that are needed.<sup>2</sup>

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<sup>1</sup>Abraham A. Ribicoff, "The Challenges Confronting Vocational Education, "American Vocational Journal, 37:15, February, 1962.

<sup>2</sup>Ibid.

Mobley was in complete agreement when he made the following statement:

Vocational and technical education will be emphasized more in the next five years than it has been for the past 30 years. This is a necessary development if the nation is to meet its manpower requirements in the period ahead.<sup>3</sup>

However, vocational education, alone, was clearly insufficient. A basic knowledge of several other subjects was necessary for many vocations. Hill and Tom were of the opinion that mathematics was one of these subjects.<sup>4</sup>

For several years, this opinion has also been held by the mathematics department at Elkhart, Indiana, High School. As a result, one track of the mathematics curriculum has been tailored specifically for those boys taking vocational courses. This three-year program, called the T track, was established to: (1) strengthen the student's computational ability, (2) broaden the student's knowledge of mathematical concepts, and (3) present mathematical problems, from shop situations, for solution.

However, a problem has arisen in regard to textbooks. The eleventh grade textbook, especially, has not been com-

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<sup>3</sup>M. D. Mobley, "Manpower: A Serious National Problem," American Vocational Journal, 38:8, May, 1963.

<sup>4</sup>Charles W. Hill and Frederick K. T. Tom, "Vocational Education Concepts," American Vocational Journal, 37:11, May, 1962.

pletely satisfactory. Its physical appearance and the author's style of writing have provided little motivation for the students. Many of the explanations have lacked clarity. Some of the problems possessed too great a degree of difficulty for the grade level.

These, among other reasons, indicated the need for a different eleventh grade textbook. But, no change was possible until a definitely superior textbook had been found. Thus, a careful analysis and appraisal of vocational mathematics textbooks was needed. This need was the initiating factor for this study.

#### Statement of the Problem

The purposes of this study were: (1) to list the objectives of the Math 11 T course at Elkhart High School, (2) to make a numerical appraisal of each of the selected vocational mathematics textbooks, and (3) to offer a recommendation, based upon the appraisals, for the textbook to be used in the Math 11 T course at Elkhart High School.

#### Definition of Terms

Most of the terms will be defined in the context of the report. However, two terms are of such importance that they shall be defined here for the benefit of the reader.

Vocational mathematics. Vocational mathematics will include basic arithmetic computation; a review and extension of basic concepts of algebra and geometry; an introduction

to basic concepts of trigonometry; and work with logarithms, the slide rule, formulas, per cent, ratio, proportion, exponents, indices, measurement, estimation, graphs, tables, maps, and blueprints as they apply to vocational education courses.

Vocational education courses. Vocational education courses will include all vocational education courses taught at Elkhart High School. These include auto, drafting, electricity, electronics, general metals, graphic arts, power mechanics, vocational auto, vocational building trades, vocational drafting, vocational machine trades, vocational printing, and woodwork.

#### Procedures and Limitations

Procedures. The data necessary for this study called for a documentary analysis of textbooks. Therefore, the first step was to list the objectives for the Math 11 T course. Next, based upon the list of objectives, an appraisal scale was adapted from an example by Burr.<sup>5</sup> Then, a descriptive analysis outline was adapted from an example by Clement.<sup>6</sup> Upon suggestions from the writer's major ad-

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<sup>5</sup>Samuel Engle Burr, Jr., "A Rating Scale for Textbooks," The Journal of Education, 132:138-9, May, 1949.

<sup>6</sup>John Addison Clement, Manual for Analyzing and Selecting Textbooks (Champaign, Illinois: The Garrard Press, 1942), pp. 56-63.

visor, both the analysis outline and the appraisal scale were refined. Finally, after further suggestions from members of the Elkhart High School mathematics department, the outline and the scale were deemed ready for use.<sup>7</sup>

At this point, the selected textbooks were secured. They were selected by using titles and catalogue descriptions as a very unrefined method of determining a textbook's value for the math course involved.

Next, each textbook was carefully studied and a systematic record of observations was placed on the analysis outline. The outline was used to help make a systematic appraisal of each textbook. The total points under each of the eight major divisions of the appraisal scale were determined for each of the textbooks. Then, the overall total of points was determined for each textbook.

These point totals have been presented in tabular form to be found in Appendix C. They have been presented in graphical form through the body of the report in order to show quantitative relationships more easily. The graphical presentations have been complemented by explanations intended to expand the understanding of the relationships among the data and give reasons for the conclusions that have been drawn.

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<sup>7</sup>A sample of the analysis outline is shown in Appendix A and a sample of the appraisal scale is shown in Appendix B.

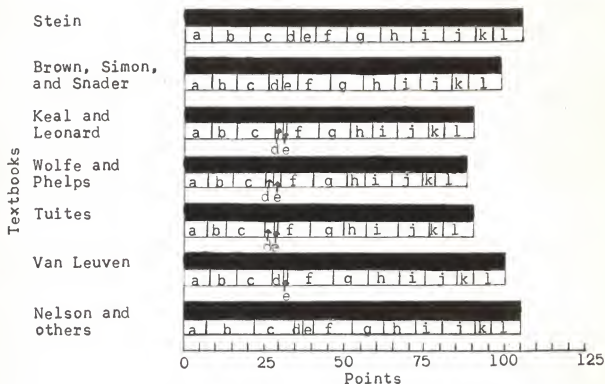


FIGURE 3

, COMPARISON OF THE APPRAISALS\* OF THE SELECTED TEXTBOOKS  
IN THE AREA OF MECHANICAL FEATURES

\*The unshaded bars show the breakdown of the total appraisals into their components as follows:

- a--waterproof binding
- b--durability of binding
- c--type of cover
- d--color of cover
- e--design of cover
- f--quality and clarity of illustrations
- g--size and shape of book
- h--color of paper
- i--texture and surface of paper
- j--size of type
- k--color of ink
- l--accuracy of illustrations.

and Nelson and others, lead in total appraisal for both general considerations and mechanical features.

Figure 3 shows that Nelson and others, has the best binding. This is a very important factor in the selection of a textbook due to the wear imposed on a text by the students in the course. The lack of a well designed cover for several textbooks is shown by the figure. Thus, a chance to motivate the students was overlooked.

Selection of subject matter. Figure 4 presents the appraisals of the textbooks under the area of selection of subject matter. The high appraisal for Keal and Leonard shows that a great deal of thought was given to the proper selection of the subject matter for this kind of text.

The very low appraisal of Tuites corroborated the findings of Figure 2, page 14, that this text should be excluded from consideration. The data indicate that Wolfe and Phelps lacked a good review of basic arithmetic and that the material was too difficult for the grade level. Therefore, this text was also dropped from consideration.

The data further show that all of the texts except Keal and Leonard lacked a good review of mathematical concepts other than basic arithmetic. This would throw an added burden on the teacher because the students would need as much review as possible of the mathematical concepts which had previously been learned.

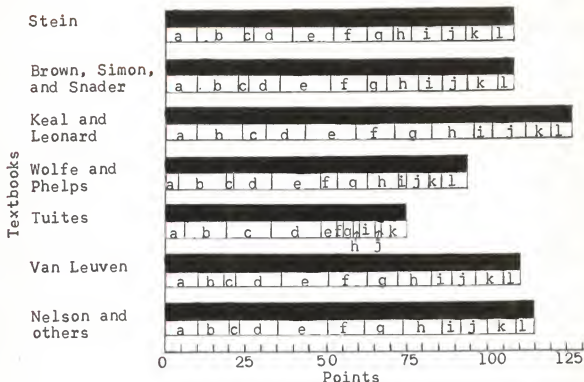


FIGURE 4

#### COMPARISON OF THE APPRAISALS\* OF THE SELECTED TEXTBOOKS IN THE AREA OF SELECTION OF SUBJECT MATTER

\*The unshaded bars show the breakdown of the total appraisals into their components as follows:

a--adequate review of arithmetic

b--adequate review and extension of algebra, geometry, and trigonometry

c--adequate review of other old mathematical concepts

d--adequate development of new mathematical concepts

e--use of concrete materials

f--adequate degree of difficulty of materials

g--applications to all courses in vocational education curriculum

h--application of materials to community needs

i--adequate amount of exercises for slower students

j--adequate amount of exercises for brighter students

k--exclusion of exercises too difficult for grade level

l--inclusion of challenging exercises for exceptional students.

All of the texts have used concrete materials to a large extent. This would be very helpful for the type of student in the course.

Organization and Presentation. Figure 5 shows Brown, Simon, and Snader and Nelson and others, leading in the appraisal of the very important area of organization and presentation of the subject matter. However, it is also indicated that Brown, Simon, and Snader was not very adaptable to a pragmatic program and there was a lack of proper technical vocabulary. Thus, it was questionable whether the text would serve the purposes of the course well enough or not.

However, only Brown, Simon, and Snader shows a systematic development of reasoning power and good use of color through the text for motivation. So, the text was not eliminated from consideration.

Figure 5 also indicates that only Brown, Simon, and Snader and Nelson and others, have a thorough set of diagnostic testing materials. This would be very helpful to the teacher, although it is not an absolute necessity and did not eliminate any other textbooks from consideration.

Techniques or features. Brown, Simon, and Snader has a fairly substantial lead in the appraisals of the division of techniques or features as shown in Figure 6, page 20.

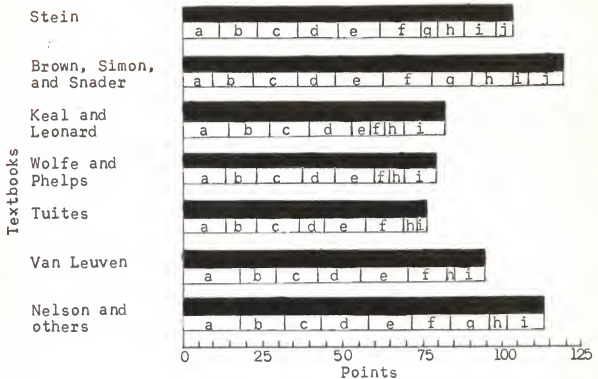


FIGURE 5

### COMPARISON OF THE APPRAISALS\* OF THE SELECTED TEXTBOOKS IN THE AREA OF ORGANIZATION AND PRESENTATION

\*The unshaded bars show the breakdown of the total appraisals into their components as follows:

- a--adaptability to a pragmatic program
- b--adequacy of sequence of subject matter
- c--possibility of omissions without destroying sequence
- d--emphasis on a variety of topics
- e--plan for problem solution
- f--sufficient detail in presenting material
- g--variety and effectiveness of diagnostic testing materials
- h--systematic development of reasoning power
- i--varied and applicable use of technical vocabulary
- j--use of color for emphasis and variability.

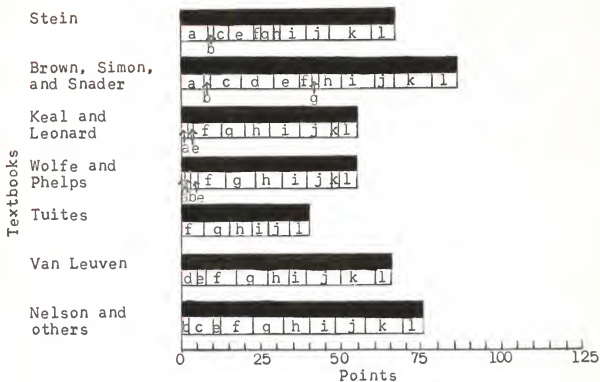


FIGURE 6

#### COMPARISON OF THE APPRAISALS\* OF THE SELECTED TEXTBOOKS IN THE AREA OF TECHNIQUES OR FEATURES

\*The unshaded bars show the breakdown of the total appraisals into their components as follows:

- a--inclusion of supplementary materials for brighter students
- b--inclusion of extra help for slower students
- c--inclusion of means for evaluating achievement
- d--statement by author recognizing need for complementary use of psychological and logical principles
- e--adequacy of content for complementary use of psychological and logical principles
- f--use of life situations in explanations for motivation
- g--use of life situations in exercises for motivation
- h--use of life situations in pictorial illustrations for motivation
- i--integration of subject matter learned in previous courses with new subject matter
- j--integration of subject matter learned in present course with new subject matter
- k--use of modern costs and wage scales in exercises
- l--attractiveness of book and contents.

However, a lack is shown in two areas--motivation through ordinary life situations and extra help for the slower students. Of course, all of the texts are lacking in the latter area. Thus, any text chosen would be somewhat deficient.

On the other hand, only Brown, Simon, and Snader has a suitable statement concerning the complementary use of the psychological and logical principles of teaching. The proper use of these two principles would help to improve the reasoning power of the students and this is a very desirable goal. Another desirable feature--a means for evaluating achievement--is shown only by Brown, Simon, and Snader and Nelson and others.

The lack of modern costs and wage scales in the exercises further supports the exclusion of Tuites and Wolfe and Phelps from consideration. This lack also lowered the possibility of selecting Keal and Leonard as the textbook for the course.

Teaching Aids. Figure 7 shows Brown, Simon, and Snader to be leading in total appraisal in the area of teaching aids. However, most of this lead has come from the lack of a teacher's manual for most of the other textbooks. Nelson and others, also lacks a preface, but is very high in all other phases.

Both Nelson and others, and VanLeuven show an except-

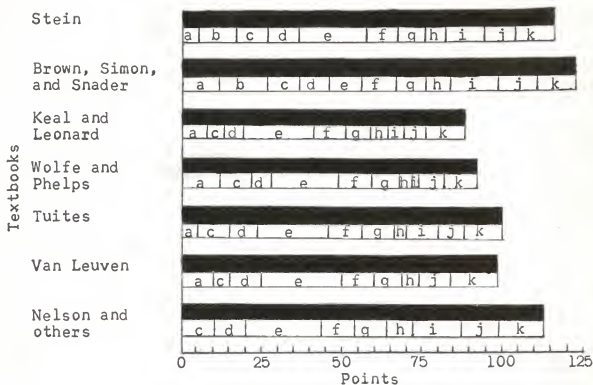


FIGURE 7

COMPARISON OF THE APPRAISALS\* OF THE SELECTED  
TEXTBOOKS IN THE AREA OF TEACHING AIDS

\*The unshaded bars show the breakdown of the total appraisals into their components as follows:

- a--preface of information for the teacher
- b--teacher's manual or guide book
- c--adequacy of table of contents
- d--adequacy of index
- e--adequacy of appendixes
- f--adequacy of charts and diagrams
- g--appropriateness of illustrations, charts, and diagrams
- h--effectiveness of illustrations
- i--adequacy of summaries and reviews
- j--study aids for pupils
- k--adequacy of definitions of technical terms used.

ionally good set of appendixes. The information listed in such appendixes is especially essential for the Math 11 T course and, thus, the possibility of choosing either of these textbooks was considerably enhanced. However, a complete lack of summaries and reviews seriously hurt VanLeuven's chance of being chosen since summaries and reviews are so helpful to the students.

Proper documentation. Figure 8 indicates that Brown, Simon, and Snader also leads in total appraisal in the area of proper documentation. It is also apparent that four of the seven textbooks had no documentation for charts, tables, diagrams and pictorial illustrations. Although this documentation is not absolutely necessary for the students' benefit, the lack of it led the researcher to the conclusion that other parts of the textbooks may have been produced with the same carelessness. Thus, these textbooks were considered poor choices. Of course, two of the four textbooks had already been dropped from consideration and a third had been considered a poor choice earlier. Therefore, Stein was the only textbook still under serious consideration to be affected by the lack of documentation.

Total appraisals. Figure 9, page 25, shows the total appraisals for Brown, Simon, and Snader and Nelson and

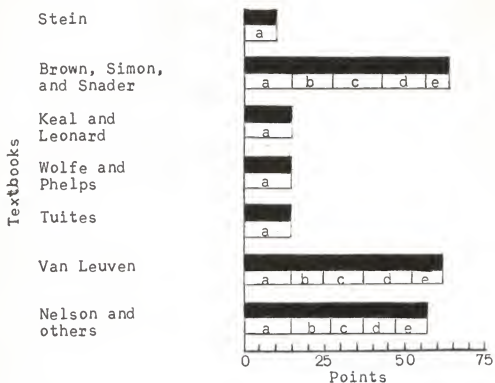


FIGURE 8

### COMPARISON OF THE APPRAISALS\* OF THE SELECTED TEXTBOOKS IN THE AREA OF PROPER DOCUMENTATION

\*The unshaded bars show the breakdown of the total appraisals into their components as follows:

- a--proper documentation for textual material
- b--proper documentation for charts
- c--proper documentation for tabulations
- d--proper documentation for diagrams
- e--proper documentation for pictorial illustrations.

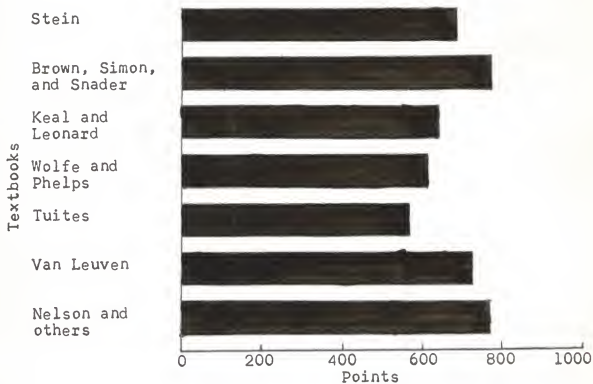


FIGURE 9

COMPARISON OF THE TOTAL APPRAISALS  
OF THE SELECTED TEXTBOOKS

others, to be extremely close. These two are followed fairly closely by Van Leuven. The other textbooks trail by much larger margins. This seems to indicate that either Brown, Simon, and Snader or Nelson and others, would be the best choice for the textbook for the Math 11 T course.

## CONCLUSIONS AND RECOMMENDATIONS

### Conclusions

As previously noted, Tuites was dropped from consideration because of an outdated copyright and poor correlation between the material in the text and the general objectives of the school. Also, Wolfe and Phelps was excluded from consideration because it lacked a good arithmetic review and the material was too difficult for the grade level.

Keal and Leonard was deemed a poor choice because of an outdated copyright, inadequate use of psychological and logical principles of teaching, and improper documentation of materials in the text. Stein was also considered a poor choice because of a poor technical vocabulary, an inadequate review of previously learned mathematical concepts other than basic arithmetic, and poor use of life situations for motivation.

Van Leuven was rated the lowest of the three remaining textbooks because of a complete lack of testing materials and summaries or reviews. Therefore, because of the closeness of their total appraisals, it seemed that either Brown, Simon, and Snader or Nelson and others, would be the best choice. However, Brown, Simon, and Snader lacked a good technical vocabulary. Thus, although

deficient in a few areas, Nelson and others, was chosen as the best textbook for the Math 11 T course.

Recommendations

Therefore, it was recommended to the Elkhart, Indiana, High School mathematics department that General Mathematics for the Shop by Gilbert D. Nelson, Frank C. Moore, Carl Hamburger, and Philip Becker be adopted as the textbook for the Math 11 T course.

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## APPENDIXES

## APPENDIX A.

## SAMPLE ANALYSIS OUTLINE

Text \_\_\_\_\_

Author(s) \_\_\_\_\_

## I. AUTHORSHIP.

## A. AUTHOR'S BACKGROUND.

1. Is a statement of the author's scholarship in the subject given in the preface, the introduction, or nowhere in the text?
2. Does he have a background of both math and vocational education?
3. Is a statement of the author's teaching experience given in the preface, the introduction, or nowhere in the text?
4. How much experience has he had?

## B. WRITING STYLE.

1. Is a knowledge of the subject shown throughout the text?
2. Is the author's experience shown through his writing style?

## C. METHOD EMPLOYED IN TESTING THE MATERIAL.

1. General experience in the classroom but no systematic try-out before publishing.
2. Tried out in the classroom without controlled conditions.
3. Tried out in classroom with controlled conditions.
4. Not used in classroom at all.

## D. REASONS FOR WRITING THE TEXT.

1. Are the reasons stated or implied in the preface, the introduction, some other part of the text, or nowhere in the text?
2. Are the reasons stated given in terms of content, teaching method, pupil interests and abilities, grade level, any combination of these factors, or some other factor?

## E. INTELLIGIBILITY OF VOCABULARY.

1. Does the author completely avoid very difficult language, use some difficult language, or use much difficult language?
2. Does the author use little or much technical language?
3. Does the author use technical language from various vocations?

## II. GENERAL CONSIDERATIONS.

## A. SUITABILITY OF THE TEXT FOR THE SITUATION.

1. Is the text adapted to the general purposes of the school and to the corresponding courses of study in the program?
2. Is the author's style of writing immature, on the same level, or too mature for the grade level involved?
3. How long is the text and could any parts be omitted?
4. What company publishes the text?
5. What is the school price of the text?

### III. MECHANICAL FEATURES.

#### A. BINDING AND COVER.

1. What type of binding has been used?
2. What type of cover has been used?
3. What color and design have been used for the cover?

#### B. WHAT IS THE SIZE OF THE TEXT IN LINEAR MEASURE?

#### C. NATURE OF PAPER AND PRINTING.

1. What type of finish does the paper have?
2. What color is the paper?
3. What size type has been used?
4. What color of ink has been used?

#### D. ILLUSTRATION.

1. Are the illustrations in pertinent positions?
2. Are the illustrations accurate in regard to vocational situations?

### IV. SELECTION OF SUBJECT MATTER.

#### A. BASIC VALUE OF MATERIAL.

1. How much arithmetic review is included?
2. What algebraic, geometric, and trigonometric concepts are included?
3. What other reviews are included?
4. What other new concepts are included?

#### B. ADAPTABILITY OF MATERIAL.

1. Is the material concrete or abstract?
2. Does the material involve extremely elementary situations?

#### C. VARIETY OF APPLICATION OF MATERIAL.

1. To what vocational education courses does the material apply?
2. To what situations in the community does the material apply?

#### D. AMOUNT AND DIFFICULTY OF EXERCISES.

1. Are exercises provided for all presentations of material?
2. Are the exercises grouped for varying ability?
3. Are there exercises too difficult for the grade level?
4. Are there exercises to challenge the better student?

## V. ORGANIZATION AND PRESENTATION.

### A. ORGANIZATION OF MATERIAL.

1. Is the material organized into units, topics, chapters, or some other type of division?
2. Is the material arranged in a logical sequence?
3. Is each part of the material dependent upon the previous material?

### B. PRESENTATION.

1. Is little or much detail used in presentation?
2. Is emphasis placed on a variety of topics?
3. What plans are given for problem solution?
4. What diagnostic tests are included?
5. Does the author use leading questions?
6. To what vocational education courses does the technical vocabulary apply?
7. Have different colors been used in the text?

## VI. TECHNIQUES OR FEATURES.

### A. PROVISION FOR INDIVIDUAL DIFFERENCES.

1. What supplementary material has been included?
2. What achievement tests have been included?

### B. RECOGNITION AND COMPLEMENTARY USE OF PSYCHOLOGICAL AND LOGICAL PRINCIPLES.

1. Is a statement given in the preface, introduction, elsewhere in the text, or nowhere in the text?
2. Does the content include both principles.

### C. MOTIVATION THROUGH LIFE SITUATIONS.

1. Have vocational situations been used in explanations, exercises, or illustrations?

### D. INTEGRATION OF SUBJECT MATTER?

1. What use is made of material learned in previous courses?
2. What use is made later in the text of material learned earlier in the text?

### E. WHAT EVIDENCE IS THERE OF MODERN FINANCIAL SITUATIONS IN THE EXERCISES?

### F. ARE THE BOOK AND CONTENTS ATTRACTIVE?

## VII. TEACHING AIDS.

### A. WHAT AIDS ARE FOUND WITHIN THE BOOK?

1. Found at the beginning of the text: teachers preface, table of contents, lists of illustrations.
2. Found through the body of the text: charts, diagrams, pictorial illustrations, summaries, reviews, definitions.
3. Found at the end of the text: index, log tables, trig tables, decimal equivalents, other tables.

### B. WHAT AIDS ARE FOUND OUTSIDE THE BOOK?

1. Teacher's manual?
2. Workbook?
3. Suggested audio-visual aids?

## VIII. DOCUMENTATION.

- A. IS THE MATERIAL ORIGINAL OR IS ALL OR PART OF IT BORROWED?
- B. IS THE SOURCE GIVEN FOR CHARTS, TABLES, DIAGRAMS, OR OTHER ILLUSTRATIONS?

## APPENDIX B.

## SAMPLE APPRAISAL SCALE

| ITEM                                                                                     | POSSIBLE POINTS |
|------------------------------------------------------------------------------------------|-----------------|
| I. AUTHORSHIP                                                                            |                 |
| A. The author's scholarship in the subject field:                                        | 30              |
| B. The author's classroom or other teaching experience:                                  | 30              |
| C. The author's ability to reflect his scholarship and experience through writing style: | 25              |
| D. The author's approach to construction of a valuable and understandable textbook:      |                 |
| 1. Through experimentation in the classroom with the material:                           | 10              |
| 2. Through a statement of aims or reasons for writing the textbook:                      | 10              |
| 3. Through the use of an appropriate general vocabulary:                                 | 10              |
| 4. Through the use of an appropriate technical vocabulary:                               | 10              |
|                                                                                          | TOTAL: 125      |
| II. GENERAL CONSIDERATIONS                                                               |                 |
| A. Recency of copyright date:                                                            | 20              |
| B. Correlation of material with general objectives of the school:                        | 20              |
| C. Suitability of the author's style for pupils in this grade level and course:          | 20              |
| D. Length of text in regard to amount of time available for the course:                  | 10              |
| E. Availability of book in desired quantities:                                           | 20              |
| F. Comparative cost per copy:                                                            | 10              |
|                                                                                          | TOTAL: 100      |
| III. MECHANICAL FEATURES                                                                 |                 |
| A. Waterproof binding:                                                                   | 10              |
| B. Durability of binding:                                                                | 15              |
| C. Type of cover:                                                                        | 15              |
| D. Color of cover:                                                                       | 5               |
| E. Design of cover:                                                                      | 5               |
| F. Quality and clarity of illustrations:                                                 | 20              |
| G. Size of textbook:                                                                     | 10              |
| H. Color of paper:                                                                       | 10              |
| I. Texture of paper:                                                                     | 10              |
| J. Size and design of type:                                                              | 10              |
| K. Color of ink:                                                                         | 5               |

|                                                                                                                        |     |
|------------------------------------------------------------------------------------------------------------------------|-----|
|                                                                                                                        | 37  |
| L. Accuracy of illustrative materials:                                                                                 | 10  |
| TOTAL:                                                                                                                 | 125 |
| IV. SELECTION OF SUBJECT MATTER                                                                                        |     |
| A. Basic value of material:                                                                                            |     |
| 1. Adequate review of basic arithmetic computation:                                                                    | 10  |
| 2. Adequate extension of algebra and geometry and an introduction to trigonometry:                                     | 15  |
| 3. Adequate review of other, previously learned, mathematical concepts and their applications to vocational education: | 10  |
| 4. Adequate development of other new mathematical concepts and their applications to vocational education:             | 15  |
| B. Adaptability of material to class needs:                                                                            |     |
| 1. Use of concrete materials:                                                                                          | 15  |
| 2. Adequate degree of difficulty of materials for the grade level:                                                     | 15  |
| C. Variety of practical applications of materials:                                                                     |     |
| 1. Applications to all courses in vocational education curriculum:                                                     | 15  |
| 2. Application of materials to community needs:                                                                        | 15  |
| D. Abundance and grading of exercises to meet individual and group abilities and needs:                                |     |
| 1. Adequate amount of exercises for slower students:                                                                   | 10  |
| 2. Adequate amount of exercises for brighter students:                                                                 | 10  |
| 3. Exclusion of exercises too difficult for the grade level:                                                           | 10  |
| 4. Inclusion of challenging exercises for exceptional students:                                                        | 10  |
| TOTAL:                                                                                                                 | 150 |
| V. ORGANIZATION AND PRESENTATION                                                                                       |     |
| A. Adaptability to a pragmatic program:                                                                                | 20  |
| B. Adequacy of sequence of subject matter:                                                                             | 15  |
| C. Possibility of omissions without destroying sequence:                                                               | 10  |
| D. Well-proportioned emphasis on a variety of topics:                                                                  | 15  |
| E. Plan for problem solution:                                                                                          | 15  |
| F. Sufficient detail in presenting material:                                                                           | 15  |
| G. Variety and effectiveness of diagnostic testing materials:                                                          | 15  |
| H. Systematic development of reasoning power:                                                                          | 15  |
| I. Varied and applicable use of technical vocabulary:                                                                  | 15  |
| J. Use of color for emphasis and variability:                                                                          | 15  |
| TOTAL:                                                                                                                 | 150 |

## VI. TECHNIQUES OR FEATURES

|                                                                               |     |
|-------------------------------------------------------------------------------|-----|
| A. Provision for individual differences:                                      |     |
| 1. Inclusion of supplementary material for brighter students:                 | 10  |
| 2. Inclusion of extra help for slower students:                               | 10  |
| 3. Inclusion of means for evaluating achievement:                             | 10  |
| B. Recognition and complementary use of psychological and logical principles: |     |
| 1. Suitable statement by author:                                              | 10  |
| 2. Adequacy of content for complementary use of the principles:               | 10  |
| C. Use of life situations for motivation:                                     |     |
| 1. Through use in explanations:                                               | 10  |
| 2. Through use in exercises:                                                  | 10  |
| 3. Through use in pictorial illustrations:                                    | 10  |
| D. Integration of previously learned subject matter with new subject matter:  |     |
| 1. Concerning subject matter learned in previous courses:                     | 10  |
| 2. Concerning subject matter learned in present course:                       | 10  |
| E. Use of modern day costs and wage scales in exercises:                      | 15  |
| F. Attractiveness of book and contents:                                       | 10  |
| TOTAL:                                                                        | 125 |

## VII. TEACHING AIDS

|                                                            |     |
|------------------------------------------------------------|-----|
| A. A preface of information for the teacher:               | 15  |
| B. Teacher's manual or guide book:                         | 15  |
| C. Adequacy of table of contents:                          | 10  |
| D. Adequacy of index:                                      | 10  |
| E. Adequacy of appendixes (log tables, trig tables, etc.): | 25  |
| F. Adequacy of charts and diagrams:                        | 10  |
| G. Appropriateness of illustrations, charts, and diagrams: | 10  |
| H. Effectiveness of illustrations:                         | 10  |
| I. Adequacy of summaries and reviews:                      | 15  |
| J. Study aids for pupils:                                  | 15  |
| K. Adequacy of definitions of technical terms used:        | 15  |
| TOTAL:                                                     | 150 |

## VIII. PROPER DOCUMENTATION

|                                 |    |
|---------------------------------|----|
| A. For textual material:        | 20 |
| B. For charts:                  | 15 |
| C. For tabulations:             | 15 |
| D. For diagrams:                | 15 |
| E. For pictorial illustrations: | 10 |
| TOTAL:                          | 75 |

TOTAL POSSIBLE VALUATION: 1000

## APPENDIX C.

## APPRAISALS OF THE SELECTED TEXTBOOKS

| ITEM     | Stein      | Brown, Simon,<br>and Snader | Keal and<br>Leonard | Wolfe and<br>Phelps | Tuites     | Van Leuven | Nelson and<br>others |
|----------|------------|-----------------------------|---------------------|---------------------|------------|------------|----------------------|
| I.       |            |                             |                     |                     |            |            |                      |
| A. . . . | 20         | 20                          | 30                  | 30                  | 30         | 30         | 30                   |
| B. . . . | 30         | 30                          | 30                  | 30                  | 30         | 28         | 30                   |
| C. . . . | 20         | 22                          | 20                  | 20                  | 18         | 22         | 24                   |
| D. . . . |            |                             |                     |                     |            |            |                      |
| 1. . . . | 5          | 7                           | 7                   | 7                   | 7          | 5          | 5                    |
| 2. . . . | 8          | 8                           | 9                   | 10                  | 10         | 10         | 0                    |
| 3. . . . | 8          | 9                           | 9                   | 8                   | 8          | 9          | 7                    |
| 4. . . . | 2          | 2                           | 8                   | 7                   | 5          | 10         | 10                   |
| TOTAL:   | <u>93</u>  | <u>98</u>                   | <u>113</u>          | <u>112</u>          | <u>108</u> | <u>114</u> | <u>106</u>           |
| II.      |            |                             |                     |                     |            |            |                      |
| A. . . . | 20         | 18                          | 5                   | 15                  | 7          | 10         | 14                   |
| B. . . . | 18         | 20                          | 15                  | 15                  | 8          | 18         | 20                   |
| C. . . . | 16         | 15                          | 16                  | 20                  | 16         | 20         | 20                   |
| D. . . . | 9          | 5                           | 10                  | 7                   | 8          | 6          | 7                    |
| E. . . . | 20         | 20                          | 20                  | 20                  | 20         | 20         | 20                   |
| F. . . . | 8          | 7                           | 10                  | 9                   | 6          | 8          | 10                   |
| TOTAL:   | <u>91</u>  | <u>85</u>                   | <u>76</u>           | <u>86</u>           | <u>65</u>  | <u>82</u>  | <u>91</u>            |
| III.     |            |                             |                     |                     |            |            |                      |
| A. . . . | 8          | 8                           | 8                   | 7                   | 7          | 8          | 7                    |
| B. . . . | 12         | 8                           | 8                   | 8                   | 6          | 8          | 15                   |
| C. . . . | 12         | 10                          | 12                  | 10                  | 12         | 12         | 12                   |
| D. . . . | 4          | 4                           | 3                   | 3                   | 3          | 3          | 3                    |
| E. . . . | 4          | 5                           | 1                   | 2                   | 1          | 1          | 3                    |
| F. . . . | 10         | 10                          | 10                  | 10                  | 10         | 15         | 12                   |
| G. . . . | 10         | 10                          | 10                  | 10                  | 10         | 10         | 10                   |
| H. . . . | 10         | 10                          | 6                   | 6                   | 7          | 10         | 10                   |
| I. . . . | 10         | 8                           | 8                   | 8                   | 10         | 8          | 8                    |
| J. . . . | 10         | 10                          | 10                  | 10                  | 10         | 10         | 10                   |
| K. . . . | 5          | 5                           | 4                   | 4                   | 4          | 5          | 5                    |
| L. . . . | 10         | 10                          | 10                  | 10                  | 10         | 10         | 10                   |
| TOTAL:   | <u>105</u> | <u>98</u>                   | <u>90</u>           | <u>88</u>           | <u>90</u>  | <u>100</u> | <u>105</u>           |

## IV.

|        |   |   |   |   |     |     |     |    |    |     |     |
|--------|---|---|---|---|-----|-----|-----|----|----|-----|-----|
| A.     | . | . | . | . |     |     |     |    |    |     |     |
| 1.     | . | . | . | . | 10  | 10  | 10  | 4  | 6  | 10  | 10  |
| 2.     | . | . | . | . | 15  | 13  | 14  | 15 | 13 | 8   | 10  |
| 3.     | . | . | . | . | 3   | 3   | 8   | 2  | 0  | 4   | 3   |
| 4.     | . | . | . | . | 12  | 10  | 12  | 12 | 14 | 14  | 12  |
| B.     | . | . | . | . |     |     |     |    |    |     |     |
| 1.     | . | . | . | . | 13  | 15  | 15  | 15 | 15 | 15  | 15  |
| 2.     | . | . | . | . | 10  | 12  | 12  | 5  | 5  | 12  | 12  |
| C.     | . | . | . | . |     |     |     |    |    |     |     |
| 1.     | . | . | . | . | 8   | 6   | 12  | 10 | 2  | 10  | 12  |
| 2.     | . | . | . | . | 8   | 10  | 13  | 10 | 3  | 10  | 12  |
| D.     | . | . | . | . |     |     |     |    |    |     |     |
| 1.     | . | . | . | . | 7   | 7   | 6   | 2  | 2  | 6   | 6   |
| 2.     | . | . | . | . | 8   | 8   | 10  | 7  | 5  | 8   | 8   |
| 3.     | . | . | . | . | 8   | 10  | 8   | 4  | 2  | 8   | 9   |
| 4.     | . | . | . | . | 6   | 5   | 7   | 8  | 8  | 6   | 6   |
| TOTAL: |   |   |   |   | 108 | 109 | 127 | 94 | 75 | 111 | 115 |

## V.

|        |   |   |   |   |    |     |    |    |    |    |     |
|--------|---|---|---|---|----|-----|----|----|----|----|-----|
| A.     | . | . | . | . | 12 | 10  | 15 | 14 | 14 | 18 | 18  |
| B.     | . | . | . | . | 12 | 12  | 13 | 10 | 10 | 12 | 14  |
| C.     | . | . | . | . | 7  | 9   | 7  | 9  | 8  | 8  | 7   |
| D.     | . | . | . | . | 13 | 12  | 13 | 10 | 8  | 13 | 14  |
| E.     | . | . | . | . | 13 | 15  | 6  | 12 | 12 | 15 | 14  |
| F.     | . | . | . | . | 13 | 15  | 5  | 5  | 12 | 12 | 12  |
| G.     | . | . | . | . | 5  | 13  | 0  | 0  | 0  | 0  | 12  |
| H.     | . | . | . | . | 8  | 13  | 5  | 5  | 5  | 2  | 5   |
| I.     | . | . | . | . | 10 | 5   | 13 | 10 | 3  | 10 | 12  |
| J.     | . | . | . | . | 5  | 10  | 0  | 0  | 0  | 0  | 0   |
| TOTAL: |   |   |   |   | 98 | 114 | 77 | 75 | 72 | 90 | 108 |

## VI.

|        |   |   |   |   |    |    |    |    |    |    |    |
|--------|---|---|---|---|----|----|----|----|----|----|----|
| A.     | . | . | . | . |    |    |    |    |    |    |    |
| 1.     | . | . | . | . | 8  | 7  | 2  | 1  | 0  | 0  | 0  |
| 2.     | . | . | . | . | 2  | 2  | 0  | 2  | 0  | 0  | 2  |
| 3.     | . | . | . | . | 5  | 10 | 0  | 0  | 0  | 0  | 8  |
| B.     | . | . | . | . |    |    |    |    |    |    |    |
| 1.     | . | . | . | . | 0  | 10 | 0  | 0  | 0  | 5  | 0  |
| 2.     | . | . | . | . | 8  | 8  | 2  | 2  | 0  | 2  | 2  |
| C.     | . | . | . | . |    |    |    |    |    |    |    |
| 1.     | . | . | . | . | 2  | 4  | 9  | 9  | 7  | 10 | 10 |
| 2.     | . | . | . | . | 4  | 2  | 7  | 9  | 8  | 10 | 10 |
| 3.     | . | . | . | . | 2  | 7  | 8  | 8  | 7  | 7  | 8  |
| D.     | . | . | . | . |    |    |    |    |    |    |    |
| 1.     | . | . | . | . | 8  | 10 | 9  | 8  | 5  | 8  | 8  |
| 2.     | . | . | . | . | 7  | 6  | 10 | 8  | 7  | 8  | 9  |
| E.     | . | . | . | . | 13 | 12 | 2  | 2  | 0  | 10 | 12 |
| F.     | . | . | . | . | 8  | 8  | 6  | 6  | 6  | 6  | 7  |
| TOTAL: |   |   |   |   | 67 | 86 | 55 | 55 | 40 | 66 | 76 |

## VII.

|          |            |            |           |           |            |           |            |
|----------|------------|------------|-----------|-----------|------------|-----------|------------|
| A. . . . | 5          | 12         | 8         | 12        | 5          | 10        | 0          |
| B. . . . | 12         | 15         | 0         | 0         | 0          | 0         | 0          |
| C. . . . | 10         | 10         | 5         | 10        | 10         | 5         | 10         |
| D. . . . | 10         | 9          | 6         | 7         | 9          | 10        | 10         |
| E. . . . | 20         | 10         | 22        | 20        | 22         | 25        | 24         |
| F. . . . | 10         | 10         | 10        | 10        | 10         | 10        | 10         |
| G. . . . | 9          | 10         | 8         | 9         | 10         | 9         | 10         |
| H. . . . | 6          | 8          | 5         | 4         | 4          | 5         | 8          |
| I. . . . | 12         | 15         | 5         | 2         | 10         | 0         | 15         |
| J. . . . | 10         | 12         | 7         | 8         | 8          | 10        | 12         |
| K. . . . | 12         | 12         | 12        | 10        | 12         | 14        | 14         |
| TOTAL:   | <u>116</u> | <u>123</u> | <u>88</u> | <u>92</u> | <u>100</u> | <u>98</u> | <u>113</u> |

## VIII.

|          |           |           |           |           |           |           |           |
|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| A. . . . | 10        | 15        | 15        | 15        | 15        | 15        | 15        |
| B. . . . | 0         | 13        | 0         | 0         | 0         | 10        | 12        |
| C. . . . | 0         | 15        | 0         | 0         | 0         | 12        | 10        |
| D. . . . | 0         | 13        | 0         | 0         | 0         | 15        | 10        |
| E. . . . | 0         | 8         | 0         | 0         | 0         | 10        | 10        |
| TOTAL:   | <u>10</u> | <u>64</u> | <u>15</u> | <u>15</u> | <u>15</u> | <u>62</u> | <u>57</u> |

OVERALL TOTAL: 688      777      641      617      565      723      771

AN ANALYTIC APPRAISAL OF SELECTED HIGH SCHOOL  
VOCATIONAL MATHEMATICS TEXTBOOKS

by

JAMES MICHAEL EGER

B. S., Western Michigan University, 1959

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ABSTRACT OF A MASTER'S REPORT

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

School of Education

KANSAS STATE UNIVERSITY  
Manhattan, Kansas

1965

For several years, the mathematics department at Elkhart, Indiana, High School has offered a multi-track curriculum to the high school students. One of these tracks was geared to meet the needs of those boys taking vocational education courses. The broad objectives of the three-year program were to: (1) strengthen the student's computational ability, (2) broaden the student's knowledge of mathematical concepts, and (3) present mathematical problems, from shop situations, for solution.

However, a problem arose in that the textbooks were not completely satisfactory. This was especially true of the eleventh grade textbook. It provided little motivation for the students. Many explanations were not clear and many problems were too difficult for the grade level. Thus, it was decided to make a study of vocational mathematics textbooks to find a more suitable one for the Math 11 T course.

The specific purposes of the study were to: (1) list the objectives of the Math 11 T course, (2) make a numerical appraisal of each of the selected vocational mathematics textbooks, and (3) offer a recommendation, based upon the appraisals, for the textbook to be used in the Math 11 T course at Elkhart High School.

The first step in the study was to list the specific objectives of the course. After this was done, the textbooks

to be studied were selected by use of titles and catalogue descriptions to determine the textbook's value for the course. After the selected textbooks were secured, each one was carefully studied and observations were recorded on an analysis outline. The outline was used to help make a systematic appraisal of each textbook. Points for each textbook were totaled under each of the eight major divisions of the appraisal scale. Then, the overall total of points was determined for each textbook.

These appraisals were then used to help decide which textbook would best suit the needs of the Math 11 T course. In reviewing these appraisals, one textbook was found to have a poor correlation of its material with the general objectives of the school. Another textbook contained much material too difficult for the grade level. Still another textbook completely lacked summaries and reviews. Thus, one by one, the textbooks were dropped from consideration or deemed rather poor choices until only three remained. Of these, General Mathematics - Book Two by Dr. Kenneth Brown, Leonard Simon, and Daniel Snader and General Mathematics for the Shop by Gilbert D. Nelson, Frank C. Moore, Carl Hamburger, and Philip Becker had the highest appraisals.

Their totals were very close with the former having a slight edge. Thus, it seemed that either textbook would be a good choice from among the original selection. However,

Brown, Simon, and Snader lacked a good technical vocabulary. Since the other textbook had the necessary technical vocabulary, it was deemed the better choice. Thus, it was recommended to the Elkhart, Indiana, High School Mathematics department that Nelson and others, be adopted as the textbook for the Math 11 T course.